What is claimed is:

1. A method comprising:

incubating a mixture comprising at least one cell, a labeled invasin that encodes a detectable label, and a candidate agent under conditions wherein the labeled invasin can invade the cell; and

detecting the detectable label within the cell, wherein an increase or decrease of detectable label in the cell due to the candidate agent indicates that the candidate agent modulates invasion of the cell by the invasin.

2. The method of claim 1, wherein the candidate agent increases invasion of the cell by the labeled invasin.

3. The method of claim 1, wherein the candidate agent decreases invasion of the cell by the labeled invasin.

4. The method of claim 1, wherein the labeled invasin is a virus.

5. The method of claim 4, wherein the virus is an enveloped virus.

6. The method of claim 5, wherein the enveloped virus is selected from the group consisting of herpesvirus, orthomyxovirus, retrovirus, and influenza viruses.

7. The method of claim 5, wherein the enveloped virus is vaccinia virus.

8. The method of claim 5, wherein the enveloped virus is a smallpox virus.

9. The method of claim 4, wherein the virus is a non-enveloped virus.

10. The method of claim 9, wherein the non-enveloped virus is an adenovirus.

11. The method of claim 1, wherein the labeled invasin is a bacterium.

12. The method of claim 1, wherein the detectable label is a fluorescent protein.

13. The method of claim 1, wherein the detectable label is an enzyme.

14. The method of claim 1, wherein the candidate agent is a peptide, a compound, a monoclonal antibody, a polyclonal antibody, an altered antibody, or an enzyme.

15. The method of claim 1, wherein the candidate agent associates with the labeled invasin.

16. The method of claim 1, wherein the candidate agent associates with the cell.

17. The method of claim 1, wherein the cell is a mammalian cell.

18. The method of claim 17, wherein the cell is a human cell.

19. The method of claim 16, wherein the candidate agent associates with a receptor on the cell.

20. The method of claim 19, wherein the receptor is selected from the group consisting of an Fc receptor, heparin sulfate receptor, vitronectin receptor, Vcam-1 receptor, hemaglutinin receptor, Pvr receptor, Icam-1 receptor, decay-accelerating protein (CD55) receptor, Car (coxsackievirus-adenovirus) receptor, integrin receptor, sialic acid receptor, HAVCr-1 receptor, low-density lipoprotein receptor, BGP (biliary glycoprotein) receptor, aminopeptidease N receptor, MHC class-1 receptor, laminin receptor, nicotinic acetylcholine receptor, CD56 receptor, nerve growth factor receptor, CD46 receptor, asialoglycoprotein receptor Gp-2, alpha-dystroglycan receptor,

galactosylceramide receptor, Cxcr4 receptor, Glvr1 receptor, Ram-1 receptor, Cat receptor, Tva receptor, BLVRcp1 receptor, MHC class-2 receptor, and a complement receptor.

21. The method of claim 18, wherein the cell is selected from the group consisting of a lymphoid cell, a pulmonary cell, and an intestinal cell.

22. An agent identified according to the method of claim 1.

23. A method comprising:

incubating a mixture comprising a cell, a specimen suspected of containing at least one antibody, and a labeled invasin encoding a detectable label under conditions wherein the labeled invasin can invade the cell; and

detecting the detectable label within the cell, wherein a decrease in the detectable label in the cell due to the specimen indicates that the specimen contains an antibody that decreases invasion of the cell by the invasin.

24. The method of claim 23, wherein the specimen is an antibody preparation.

25. The method of claim 23, wherein the specimen is an immunogenic specimen.

26. The method of claim 25, wherein the immunogenic specimen is serum.

27. The method of claim 26, wherein the serum is from a human.

28. The method of claim 23, wherein the specimen is supernatant from antibody secreting cells.

29. The method of claim 28, wherein the antibody secreting cells are hybridomas.

30. The method of claim 23, wherein the specimen is an antibody preparation.

31. The method of claim 23, wherein the antibody binds to the invasin.

32. The method of claim 23, wherein the antibody binds to the cell.

33. The method of claim 32, wherein the antibody binds to a receptor on the cell.

34. The method of claim 33, wherein the receptor is selected from the group consisting of an Fc receptor, heparin sulfate receptor, vitronectin receptor, Vcam-1 receptor, hemaglutinin receptor, Pvr receptor, Icam-1 receptor, decay-accelerating protein (CD55) receptor, Car (coxsackievirus-adenovirus) receptor, integrin receptor, sialic acid receptor, HAVCr-1 receptor, low-density lipoprotein receptor, BGP (biliary glycoprotien) receptor, aminopeptidease N receptor, MHC class-1 receptor, laminin receptor, nicotinic acetylcholine receptor, CD56 receptor, nerve growth factor receptor, CD46 receptor, asialoglycoprotein receptor Gp-2, alpha-dystroglycan receptor, galactosylceramide receptor, Cxcr4 receptor, Glvr1 receptor, Ram-1 receptor, Cat receptor, Tva receptor, BLVRcp1 receptor, MHC class-2 receptor, and a complement receptor.

35. The method of claim 23, wherein the invasin is a virus.

36. The method of claim 35, wherein the virus is an enveloped virus.

37. The method of claim 36, wherein the enveloped virus is selected from the group consisting of herpesvirus, orthomyxovirus, retrovirus, and influenza viruses.

38. The method of claim 35, wherein the virus is smallpox.

39. The method of claim 35, wherein the virus is a non-enveloped virus.

40. The method of claim 39, wherein the non-enveloped virus is an adenovirus.

41. The method of claim 23, wherein the invasin is a bacterium.

42. The method of claim 23, wherein the antibodies neutralize invasion of the cell by the invasin.

43. The method of claim 23, further comprising titering the antibodies in the specimen.

44. The method of claim 43, wherein the specimen is vaccinia immunoglobulin G (VIG).

45. The method of claim 23, wherein a concentration of antibodies necessary to neutralize invasion of a cell by an invasin is determined.

46. A method comprising:

incubating a mixture comprising, an immunogenic specimen obtained from a human, a vaccinia virus that encodes a detectable label, and at least one cell under conditions wherein the vaccinia virus can infect the cell; and

detecting the detectable label in the cell, wherein a decrease in the detectable label within the cell due to the immunogenic specimen indicates that the human was exposed to smallpox.

47. The method of claim 46, wherein the immunogenic specimen is blood.

48. The method of claim 46, wherein the immunogenic specimen is serum.

49. The method of claim 46, wherein the detectable label is an enzyme.

50. The method of claim 49, wherein the enzyme is β-galactosidase.

51. The method of claim 46, wherein the label is a fluorescent protein.

52. The method of claim 46, further comprising tittering antibodies present in the immunogenic specimen that reduce invasion of the cell by the invasin.

53. A method comprising:

incubating a mixture comprising, an immunogenic specimen obtained from a human that was vaccinated with a smallpox vaccine, a vaccinia virus that expresses a detectable label, and at least one cell under conditions wherein the vaccinia virus can infect the cell; and

detecting the detectable label within the cell, wherein a decrease in the detectable label in the cell due to the immunogenic specimen indicates that the smallpox vaccine caused production of antibodies in the human that bind to the vaccinia virus.

54. The method of claim 53, wherein the immunogenic specimen is blood.

55. The method of claim 53, wherein the immunogenic specimen is serum.

56. The method of claim 53, wherein the detectable label is an enzyme.

57. The method of claim 56, wherein the detectable label is β-galactosidase.

58. The method of claim 53, wherein the detectable label is a fluorescent protein.

59. A method comprising:

incubating a mixture comprising, an invasin that encodes a detectable label and has a preselected antigen on its surface, a specimen suspected of containing an antibody that binds to the preselected antigen, and at least one cell, under conditions wherein the invasin can invade the cell; and

detecting the detectable label within the cell, wherein a decrease in the detectable label in the cell due to the specimen indicates that the specimin contains an antibody that binds to the preselected antigen.

60. The method of claim 59, wherein the invasin is an enveloped virus that was packaged in a packaging cell that displays the preselected antigen on its surface.

61. The method of claim 60, wherein the packaging cell is a recombinant cell that expresses an exogenous nucleic acid segment encoding the preselected antigen.

62. The method of claim 61, wherein the preselected antigen is a fusion protein having a predetermined peptide fused to a membrane localization signal.

63. The method of claim 62, wherein the predetermined peptide is used as a vaccine.

64. The method of claim 63, wherein the predetermined peptide is human immunodeficiency virus gp120.

65. The method of claim 59, wherein the invasin is a recombinant enveloped virus that expresses the preselected antigen within a packaging cell, wherein the preselected antigen is displayed on the surface of the packaging cell and is also displayed on the enveloped virus packaged by the packaging cell.

66. The method of claim 65, wherein the preselected antigen is a fusion protein having a predetermined peptide fused to a membrane localization signal.

67. The method of claim 66, wherein the predetermined peptide is a subunit vaccine.

68. The method of claim 66, wherein the predetermined peptide is human immunodeficiency virus gp120.

69. The method of claim 59, further comprising titering the antibody in the specimen.

70. A method comprising:

incubating a mixture comprising an antibody raised against a cell membrane preparation, an invasin that encodes a detectable label, and at least one cell; and

detecting the detectable label within the cell, wherein a decrease in the detectable label in the cell due to the antibody indicates that the antibody binds to a receptor used by the invasin to invade the cell.

71. The method of claim 70, wherein the invasin is a virus.

72. The method of claim 71, wherein the virus is an enveloped virus.

73. The method of claim 71, wherein the virus is smallpox.

74. The method of claim 71, wherein the virus is a non-enveloped virus.

75. The method of claim 70, wherein the invasin is a bacteria.

76. The method of claim 70, further comprising isolating the cellular receptor.

77. The method of claim 76, wherein a virus overlay protein blot assay, gene-transfer, or cDNA-transfer is used to isolate the cellular receptor.

78. The method of claim 76, wherein the cellular receptor is immunoseparated.

79. The method of claim 76, further comprising determining the amino acid sequence of the cellular receptor.

80. The method of claim 70, wherein the cell is transformed with an exogenous nucleic acid segment encoding the receptor used by the invasin to invade the cell.

81. The method of claim 80, wherein the cell did not express the receptor used by the invasin to invade the cell prior to being transformed with the exogenous nucleic acid segment.

82. The method of claim 70, wherein the antibody is a polyclonal antibody.

83. The method of claim 70, wherein the antibody is a monoclonal antibody.

84. A method comprising:

incubating a mixture comprising, an invasin that encodes a detectable label, a candidate agent, a subneutralizing concentration of antibodies that bind to the invasin, and at least one cell under conditions wherein the invasin can invade the cell; and

detecting the detectable label within the cell, wherein an increase or decrease in the detectable label in the cell due to the candidate agent indicates that the candidate agent modulates antibody-mediated infection of the cell.

85. The method of claim 84, wherein the invasin is a virus.

86. The method of claim 85, wherein the virus is an enveloped virus.

87. The method of claim 85, wherein the enveloped virus is smallpox.

88. The method of claim 85, wherein the virus is a non-enveloped virus.

89. The method of claim 84, wherein the invasin is a bacterium.

90. The method of claim 84, wherein the cell is a transformed cell that contains an exogenous DNA encoding a receptor used by the invasin to invade the cell.

91. The method of claim 90, wherein the transformed cell did not express the receptor used by the invasin to invade the cell prior to being transformed with the exogenous DNA.

92. The method of claim 90, wherein the exogenous DNA encodes an Fc receptor.

93. A method comprising:

incubating a mixture comprising a cell monolayer having a first side and a second side, wherein an invasin that encodes a detectable label is contacted with the cell monolayer on the first side, and an antibody is contacted with the cell monolayer on the second side; and

detecting the detectable label on the second side of the cell monolayer following incubation, wherein an increased or decreased amount of the detectable label on the second side of the cell monolayer due to the antibody indicates that the antibody mediates transport of the invasin across the cell monolayer.

94. The method of claim 93, wherein the antibody increases transport of the invasin across the cell monolayer.

95. The method of claim 93, wherein the antibody decreases transport of the invasin across the cell monolayer.

96. The method of claim 93, wherein the invasin is a virus.

97. The method of claim 96, wherein the virus is an enveloped virus.

98. The method of claim 96, wherein the virus is a non-enveloped virus.

99. The method of claim 93, wherein the invasin is a bacterium.

100. The method of claim 99, wherein the bacterium is selected from the group consisting of Shigella, Listeria, Salmonella, Tuberculosis, B. abortis, Chlamydia, and Leprosy.

101. The method of claim 93; wherein the mixture further comprises a candidate agent.

102. The method of claim 101, further comprising detecting the detectable label on the second side of the cell monolayer following incubation, wherein an increased or decreased amount of the detectable label on the second side of the cell monolayer due to the candidate agent indicates that the candidate agent mediates transport of the invasin across the cell monolayer.

103. The method of claim 93, wherein the cell monolayer comprises intestinal epithelium cells.

104. A method to assay invasin load in vivo comprising:

infecting an organism with an invasin that encodes a detectable label to produce an infected organism; and

detecting the detectable label within a specimen obtained from the infected organism.

105. The method of claim 104, wherein the organism is an avian, a mammal, or a reptile.

106. The method of claim 104, wherein the mammal is a rat, mouse, horse, dog, cat, ferret, mink, weasel, beaver, muskrat, rabbit, or cow.

107. The method of claim 104, wherein the organism is immunodeficient.

108. The method of claim 107, wherein the organism is an avian, a mammal, or a reptile.

109. The method of claim 108, wherein the mammal is a rat, mouse, horse, dog, cat, ferret, mink, weasel, beaver, muskrat, rabbit, cow, or human.

110. The method of claim 104, wherein the invasin is a bacterium.

111. The method of claim 104, wherein the invasin is a virus.

112. The method of claim 111, wherein the virus is an enveloped virus.

113. The method of claim 112, wherein the enveloped virus is selected from the group consisting of alphavirus, rhabdovirus, orthomyxovirus, retrovirus, and herpesvirus.

114. The method of claim 112, wherein the enveloped virus is vaccinia virus.

115. The method of claim 112, wherein the virus is a non-enveloped virus.

116. The method of claim 104, wherein the specimen is liver, spleen, lymph nodes, ovaries, blood, or serum.

117. The method of claim 104, wherein the detectable label is an enzyme.

118. The method of claim 117, wherein the enzyme is $\beta$-galactosidase.

119. The method of claim 117, wherein the detectable label is a fluorescent protein.

120. The method of claim 104, further comprising determining the kinetics of viral dissemination.

121. The method of claim 120, further comprising determining if administration of a vaccine, an antibody preparation, a monoclonal antibody, an enzyme, a peptide, a compound, a pharmaceutical composition, or any combination thereof, before the organism is infected with the invasin modulates viral dissemination.

122. The method of claim 120, further comprising determining if administration of a vaccine, an antibody preparation, a monoclonal antibody, an enzyme, a peptide, a compound, a pharmaceutical composition, or any combination thereof, after the organism is infected with the invasin modulates viral dissemination.

123. A kit comprising packaging material, an invasin that encodes a detectable label, and a cell that the invasin can invade.

124. The kit of claim 123, wherein the invasin is a vaccinia virus.

125. The kit of claim 124, wherein the detectable label is an enzyme.

126. The kit of claim 125, wherein the enzyme is $\beta$-galactosidase.

127. The kit of claim 123, wherein the detectable label is a fluorescent protein.

128. The kit of claim 123, wherein the cell is a HeLa cell.

129. A kit comprising packaging material and an invasin that encodes a detectable label.